EPA Comments on WaterVision's January 9, 2015 Technical Memorandum entitled "Task 1 Summary Memo: A description of recently completed data collection, conceptual design, and associated tasks"

January 22, 2015

Very soon after receipt of the above-referenced memorandum (**draft T1SM**), we arranged an in-person meeting at EPA Region 1 on January 13, 2015 to discuss the T1SM and BMP conceptual designs with you in some detail. As a follow-up to the draft T1SM and our meeting, we appreciate the opportunity to provide these comments on the draft T1SM in hopes they may somehow streamline and improve development of final designs (FD) for the project. Not every comment should necessarily require a substantive incorporation into the draft T1SM and/or FDs, but if you would be so kind as to very briefly respond to each comment provided for purposes of a final T1SM and/or beginning phases of the FDs, it would be most appreciated.

From: Hamjian, Lynne
Subject: RE: Draft Cape Cod BMP Preliminary Design Memo

1. [Ray,] It is important to confirm the wetlands permitting for the Chatham site. Please touch base with Ed Reiner in our Wetlands Program.

> **From:** Reiner, Edward
> **Cc:** Hamjian, Lynne; LeClair, Jacqueline
> **Subject:** RE: construction of a stormwater BMP near a wetlands
>
> I read the document and reviewed the plans. I agree that according to the plan Figure 2 for Oyster Pond BMP in Chatham that a Corps permit would not be required according to these plans which depict no action [sic] physical filling in wetlands. The emergency bypass level spreader and overflow bypass pipe riprap is depicted adjacent to the wetland line. The plans do not indicate a datum which must be included and typically is required in NAVD 88 datum.
>
> The plans for the Hyannis site depict and claim that no permitting will be needed since the location is not in wetlands and out of the buffer zone. I noticed, however, that the site itself may be in the 100-year flood plain and the aerobic cell (surface) will be excavated below 5 feet elevation (no datum reference provided). The plans should provide the datum reference (NAVD 88) and information on the 100 year floodplain. The potential impacts of sea level rise should also be considered as it relates to any backwater from the culvert drain at Hyannis Harbor.
>
> Edward Reiner
> Senior Wetland Scientist
> USEPA

In addition, the site plan should include the wetlands on the site plan so we can see how close along with the elevations, etc. This is important to minimize all impacts to wetlands since the BMP is so close.

Lastly, insofar as the overflow bypass pipe on the site plan (and the bottom of page 3 of the write up) which appears to discharge into the wetland area, would it not be advisable or preferred best engineering practice to avoid discharging into the wetland system? If additional funding could be

obtained, is there a way to move this pipe and/or tie back into the MS4 system? It might at least be helpful to consider other options and cost them out.

2. In Chatham, I would like to know whether or to what extent bacteria might be treated in addition to nitrogen. If some additional funding might be available, could the design be modified to control or better control both nitrogen and bacteria? Related: to what extent is the conceptual design for Chatham a reflection of (a) site constraints, (b) funding, or (c) both (a) and (b).

3. Reminder: Although the diversion structure may be constructed / retrofit, no discharge into the BMP may occur until the MS4 is tested to reasonably confirm an absence of bacteria / illicit connections.

4. On the top of page 4 of the T1SM, the first bullet discusses emergency riprap overflow level spreader. Mark V. mentioned this system will be designed with a diverter so the system can't really overflow. On large storms, water after 0.3 will stay in the stormwater pipe. My question is, will this overflow or not, and how will this impact the adjacent wetland?

5. Re: monitoring plan. Even though there is agreement to delay monitoring until 2016, the implications of a final Monitoring Plan on BMP construction needs to be considered now as part of the final design and construction phases.

6. Does the absence of a sediment forebay (due to space limitations) impact BMP operation and performance? Is there an alternative method to trap sediment for O&M by the Town?

From: Rodney, Ann
Subject: CC meeting - comments

Thank you for the invitation to attend the briefing on the Cape Cod construction projects, I found the meeting well run and interesting.

These projects are part of a larger picture - the Southeast New England Coastal Watershed Restoration Program (SNECWRP). The SNECWRP funding is to restore physical processes, improve water quality, and restore key habitat to the region's coastal waters by integrating new technologies, and applying the latest scientific developments into restoration projects. It is with this in mind that I give you the comments below:

1. Use innovative technologies wherever possible (push the envelope)
2. Monitoring is essential to measure successful (or unsuccessful) technologies used in restoration.
3. Transferability of knowledge and technology for use elsewhere

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From: Feuerbach, MaryJo
Subject: Comment about Cape Projects: bacteria monitoring

Thanks for inviting me to listen in on the meeting Tuesday. My only comment regards monitoring. I strongly encourage you to monitor the effectiveness of the practices for reducing bacteria. Many cape

communities are working to address bacteria impairments causing swimming beach and shellfish closures. It will be important to know if the stormwater practices installed in Chatham and Hyannis can be used to address both nitrogen and bacteria, since communities will want to get the "best bang for their buck." Cape communities already have arrangements to monitor bacteria levels at their beaches, so they probably have at least some capability to monitor the practices for bacteria.

From: Switzer, Diane
Cc: Bridges, Tim; Kipp, Katrina; Waterman, Ernest; Boudreau, Dan
Subject: Cape Cod BMP Project Items

It was a very good discussion Tuesday, and thank you for the videoconference for us. Tim and I have listed some items brought up at the meeting, and also a few thoughts that occurred afterward.

From Diane-

1. While the operational monitoring will not begin until 2016, this year there may be a few requests for NERL Chemistry Lab analysis for some grab samples during rain events to determine the range of concentrations of Total Nitrogen and TSS. There may also be grab samples for pathogen indicators, which will be analyzed by a municipality's lab, or other lab near to the site.

2. Three composite samples will be collected for each rain event – one at the main line, one at inflow to the BMP, and one at outflow from the BMP. These should be flow-composited. If an event lasts longer than 24 hours, at 24 hour intervals, the existing composites will be collected and preserved according to the designated protocols.

3. We'll need to submit the analytical request to the NERL Chemistry Lab for this year and next. Once we know how many rain events it could be for this year, I can draft the request.

4. A 48 hour heads up to the Chemistry Lab is needed, to make sure they have the staff notified to expect samples. This is helpful, even if the rain event ends up not being sampled.

5. Once the draft QAPP is completed after all the reviews and amendments, the final QAPP will need to have the completed Monitoring Plan attached as an appendix, since it will have the details necessary for the QA Officer's review and approval.

From Tim –

1. Parshalll Flume installed on influent and effluent. This would give an accurate total flow to system. Some stormwater maybe lost to the ground during treatment if it isn't completely sealed. I heard "99%" sealed in the meeting which means where they put the risers in is probably going to be a leaky area.

2. Sampling access to adequately collect a grab sample if needed. To monitor other parameters including turbidity and fecal coliform may be needed. Fecal or entero maybe a key long-term due to shellfish areas in Chatham as well as Hyannis harbor.

3. Install recording rain gage on site. Rainfall varies throughout the area. These small watersheds my not be represented by other locations such as the Barnstable County airport.

4. Install state of the art equipment. This is the first of its kind project and technology needs to be out in front of other projects. Other towns will be looking to use this as an example of what they should build.

5. Kiosk must be approved by Ray Cody. Too many times I see the kiosk that doesn't have enough information or give all organizations credit to those groups involved. Both projects are in somewhat high vis areas, especially Hyannis which is on the walking path from parking to the Nantucket ferry.

6. Trash screen into system installed on influent to takeout debris as well as installed in the system outlet control structures. This is somewhat easy do which will save maintenance down the road.

7. Flapper valve at end of pipe at harbor to prevent critters from getting into system as well as eliminate backflow coming into system during storms.

8. Oil skimmer system installed in the BMP which can be some type of pad system that is serviced.

9. "Driveable" grass on top of Hyannis system due to limited space and access. This is a product that will help protect the unit when servicing and give more strength to prevent damage to BMP.

From: Voorhees, Mark
Sent: Thursday, January 15, 2015 6:36 PM
To: Cody, Ray
Subject: cape conceptual design comments

The draft T1SM and its plans are clear, concise and well done. I have the following comments. In general, I think it would be useful to include some additional information in a final T1SM and/or final design submittal(s) since these can serve as a useful reference documents for others who may considering developing similar projects in the future. Hopefully, there will be many who will follow in these footsteps.

Designs:

- It would be useful to note whether or not there is any base flow from groundwater infiltration in the drains. If there is, this will become a design consideration in the development of the final design.

- Both systems will be off line systems which is preferable for water quality performance and should eliminate concerns of high flow overflows from the control structures and downstream impacts. High flow bypasses will occur at the diversion structure. The final T1SM should mention that the diversion structures will be designed to bypass high flows up to a certain

design storm frequency (e.g., 10 yr) over the diversion wall without causing upstream flooding problems due to system surcharging.

- The final T1SM should also mention that, to the extent possible, the hydraulic design of the diversion structures and hydraulic controls within treatment systems will be optimized to provide full water quality treatment of the design capacity (e.g., 0.3 inches) such that hydraulic overloading does not occur and retentions times in the saturated reservoir needed for denitrification are maintained.

- The final T1SM should include for each system the ratio of saturated storage to total system storage and discuss its relevance as an important design criterion. I believe UNH has guidelines that they use on designing these systems.

- For the final designs the design team might consider the inclusion of deep sump catch basins as added pre-treatment measures to facilitate maintenance by the municipality.

Monitoring:

- For future monitoring it would be desirable to monitor the systems at three locations each: 1) the main drain line upstream of the diversion wall; 2) upstream of the treatment system (e.g., the diversion flow); and 3) the effluent of the treatment system.

- Keeping bacteria on the table as a potential parameter to sample for a subset of sampling events could provide very valuable performance information.

From: Ray Cody
Subject: Various

Thank you for a draft T1SM that is concisely written.

1. **Mass Balance / Retention Time (Rt).** It would be helpful to understand BMP performance and unit costs as a function of (a) nitrogen input-output mass balance and (b) retention time (Rt) - perhaps *the* predominant parameter for de-nitrification performance according to UNHSC. With regards to (a), please consider / advise on how final designs might be modified, if at all, to accommodate an accurate accounting of the total mass of nitrogen treated by each BMP, including how and where additional sampling might be conducted for this purpose (e.g., total mass of nitrogen before diversion, after diversion (pre-BMP) and after treatment (post-BMP). With regards to (b), available precipitation data for New England and Cape Cod should be utilized to calculate an average time between storm events to compare with a range of Rt to help anticipate BMP performance and to ensure that the time required for de-nitrification is not somehow on average routinely offset / impacted. As I understood the conversation from our January 13th Meeting, Mark Voorhees would perform some or all of these calculations and provide you with some or all of the results for your consideration and incorporation into the project.

2. **Design Figures.** As we discussed, it would help to clarify / label the aerobic versus anaerobic zones of the treatment cells; otherwise, as we discussed, it almost appears as if the entire first of the two cells is

an aerobic treatment cell and that the system only treats 0.15 inches WQV. In addition, could a legend be provided to help explain design features?

3. **Dewatering.** For either or both sites, and considering the anticipated quite shallow groundwater table, will construction of the BMPs require compliance with the Construction General Permit (CGP)? If so, how will compliance with the CGP be implemented / accomplished?

4. **Logistics and Schedule**. Even if plans change, please include a brief description of how you conceptualize the schedule at this time, particularly considering that two (2) BMPs are to be constructed at different sites and, ostensibly at least, both constructed during the same spring period of April – May/June 2015. I suggest the *.xlsx Schedule you provided in response to our PWS could and should be updated and used as the best representation of the schedule. Again, we understand this schedule may change thereby requiring more or less routine updating until the project is completed.

5. **Re: Barnstable.** As requested in the PWS, and to the extent possible, please confirm that limited surcharging of the existing drainage system would occur under most conditions. Please include consideration of storm volumes that may exceed the 95% percentile (e.g., very large volume 'climate change' storm events).

6. **Re: Chatham:**

i. *BMP Overflow*. Is it certain that BMP output flow / overflow can be discharged via the existing ditch / channel without adverse effects to the down gradient private properties. Also, is such a discharge as contemplated likely to impact to the wetlands area such that compliance with local (Mass) and/or federal permitting may be required?

ii. *Perimeter Drain*. I thought this was a very simple yet quite helpful design component. Should or could it not also extend to encompass the 10' Wide Maintenance Road as well, if possible, in order to maintain access and condition of the road during the wetter seasons?

7. **Use of Innovative Materials for Enhanced Porosity.** Bruce J. raised an interesting possibility regarding materials having porosities as high as 0.9. Please seriously consider whether such materials may be available and appropriate, and perhaps check with UNHSC for its opinion on such a modification to the basic design specification.